

AMENDMENT AFTER FINAL
Reply to Office Action of March 19, 2004

Serial No.: 09/730,100
Attorney Docket: Case 6121

Amendments to the Claims:

The following list of claims will replace all prior versions and listing of claims in the application:

Claims 1-18 (canceled)

Claim 19 (currently amended) A method for controlling mercury emissions in an industrial process having a flue gas containing insoluble elemental mercury at a concentration of less than 100 between 5-30 $\mu\text{g}/\text{Nm}^3$, the method comprising:

- a) providing the flue gas to a wet scrubber having an aqueous alkali scrubbing liquor;
- b) mixing the flue gas with an oxidizing reagent containing chlorine in an amount sufficient to convert all of the insoluble elemental mercury into a soluble mercury species that is at least double a stoichiometric ratio normally required to oxidize all of the insoluble elemental mercury present in the flue gas;
- c) mixing the flue gas with a sulfide species using an interspatial header, said sulfide species provided in an amount sufficient to convert the soluble mercury species into insoluble mercuric sulfide;
- d) wherein step (b) and step (c) occur separately so as to avoid unwanted reactions directly between the chlorine and the sulfide species;
- e) creating a gas-liquid interface within the wet scrubber in order to: (i) entrain the insoluble mercuric sulfide generated by step (b) and step (c) within the scrubbing liquor and (ii) remove all mercury species from the flue gas; and
- f) evacuating the mercury-free flue gas from the wet scrubber.

Claims 20-21 (canceled)

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Claim 22 (previously presented) A method according to claim 19, wherein the oxidizing reagent is an oxi-acid selected from the group consisting of: Cl₂O, ClO₂, ClO₄, ClO, HClO, HClO₂, HClO₃, and HClO₄.

Claim 23 (currently amended) A method according to claim 22 19, wherein the sulfide species is selected from the group consisting of: hydrogen sulfide, aqueous hydrosulfide ions and aqueous sulfide ions.

Claims 24-25 (canceled)